3477

PR

OTS: 60-31,358

JPRS: 3477

4 July 1960

SELECTED GEOGRAPHIC ARTICLES ON THE SOVIET BLOC

Distributed by:

OFFICE OF TECHNICAL SERVICE
DEPARTMENT OF COMMERCE
WASHINGTON 25, D.C.
~~Price $1.00~~

U. S. JOINT PUBLICATIONS RESEARCH SERVICE
205 EAST 42nd STREET, SUITE 300
NEW YORK 17, N. Y.

F O R E W A R D

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JPRS: 3477

CSO: 3940-D

SELECTED GEOGRAPHIC ARTICLES ON THE SOVIET BLOC

/Following is a translation of a number of independent articles and notes published in the journal Geodezia es Kartografia (Geodetics and cartography), Budapest, vol. 10, 1958 and vol. 11, 1959/

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THE STATUS OF GEODETICS IN THE SOVIET UNION

/1958, vol.10: p.43 - 48/

Frigyes Raum

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In the summer of 1958 I had an opportunity during a study tour to look into the work of the geodetic and cartografic organs of the U.S.S.R. Our readers will be surely interested in the general situation of the Soviet surveyors and of the geodetic organization.

In the U.S.S.R., geodetics, and generally the land surveying and cartography are highly esteemed. Immediately after the Great October Socialistic Revolution, on the basis of the order signed by Lenin, the entire affair of the cartography of the U.S.S.R. was centralized, and it was declared an important business of the State. This order, one of the first measures of the new Soviet State, created the organization which, essentially still in an unchanged form, is directing even today the geodetic and cartographic works of the Soviet Union. In the U.S.S.R. everyone is nowadays convinced of the importance of the cartographic works. It is well known that without systematic geodetic works the huge constructions of the Soviet Union could not be done, and the basis of all this is the good map. The recognition of the importance of geodetics and cartography is further shown by the fact that in 1948 a decision of the Ministerial Council classified the geodetic work among the most important works of national economy, ranking with mining and communication. This decision at the same time raised the wages by 20% in the fields of decisive importance for national economy, thus also for the geodetic works. The appreciation is shown also in the fact that many received the Lenin Order and other awards and decorations of the government.

Soviet geodetics has old historical monuments. In the State museum called "Hermitage" at Leningrad, they preserve the oldest monument of Russian geodetic works, the stone of Tmutorokan. The inscription carved in the stone recalls a measurement of distance in 1068 between the towns of Kerch and Tamany. This monument is held as one of the most important ones of the ancient Russian culture. There are remains of documents from the XI. and XII. centuries related to the use and staking out of the ground, and there is still extant an "Instruction" published in 1554, in the era of Ivan the Terrible, dealing with the description and surveying of the lands, etc.

After the October Revolution, even the importance of map making has necessarily and completely changed. Previously, only a military topographical institute existed; no civilian organ used to make a map with contour lining. In addition, for each province, there was a cadastral service for the registry of landed property. All these organs had at their disposal maps of different scales and not of a uniform character for about 10% of the country's area. The Soviet government recognized in good time the tasks needed to be done in this field, and, by the already mentioned 1919 Order it created the "Glavnoe Upravlenie Geodezii i Kartografii", shortly "GUGK"—/"Supreme Authority of Geodetics and Cartography" organization/. The GUGK is the independent (autonomous) authority of the works in geodesy and cartography; until 1938 under the supervision of the State Planning Bureau, from 1938 to 1953 then under the direct supervision of the Ministerial Council, it has been functioning, but, since 1953—continued to be an independent authority—it belongs under the supervision of the Minister of Interior Affairs. The mission of the organization is that it should supply the national economy with all the maps which are required for the purpose of the opening up of the forces of production and in the interest of cultural development. Its task is to secure the various scales of civilian, military and school maps and atlases. It exercises specialist supervision over all other organs of other ministries where geodetical and cartographical work is being done. Through this supervision it assures that even at the other ministries the geodetical and cartographical works be prepared according to standardized instruction, norms and wages. It guarantees the comprehension of all more significant works done in the country within the framework of the planned economy. The task of GUGK is the distribution of cadres, as well as the training of the middle cadre. The direction of the scientific researches in the field of geodesy and cartography is also the task of GUGK.

After the revolution, the most important task was the preparation of the 1:100 000 map for the whole area of the country. Of course, maps were also made in greater details for areas more intensively cultivated or more important for a reason. By all means, the demands of those days could not require maps of large scale. At most, they made some surveying at 1:10 000 extending over larger areas. In accordance with this, the old network of triangulation was also developed. The old triangulation consisted of grids of the first order with 1500–2000 Km distances, grids of the second order which divided the large grids into 4–6 parts, and grids of the third and of the fourth order which filled out the meshes. The accuracy of this triangulation was satisfactory up to the 1:10 000 surveys.

The task set as the first task has been already accomplished still in the years prior to the Second World War. The net of triangulation covering a great part of the Soviet Union was done; even the 1:100 000 map of the whole country was substantially finished, together with maps of larger scale whenever such were needed, especially for the western and southern parts of the country. Thereby the Soviet

surveyors accomplished a huge work. Almost from the nothing, they had to create the force, the staff which, during two decades, has been able to do the surveying of an area twice as large as the entire Europe.

Meanwhile, the demands of national economy increased in regard to the surveyors, too. More and more need was for 1:5000, 1:2000, 1:1000, and in some cases even the 1:500 surveys. This made it justified that a new survey of triangulation network has begun in the Soviet Union. The accuracy of the new net satisfied also the large scale surveys. Its shape is the modern grid mesh, consisting of ca. 200 Km long links. The cardinal points of the quadrangular frames are Laplace points. In each frame, 4-5 base lines are measured. The areas encircled by the links are filled with a network with almost equal (5-20 KM) length of net side. The further condensation is by means of nets of the second, third and fourth order.

The measurements for the new triangulation network are still going on. This work is now one of the most important tasks of the Soviet surveyors. To the whole-sale works of the GUGK belongs also at present the condensation of the contouring network, and the preparation of the 1:25 000 and 1:10 000 topographical maps. We should also mention the work which is now seen in the field of map publishing. The various wall-maps, school and other atlases, tourist maps and special maps for various other purposes are issued in great numbers. The lately published big world-atlas, marine charts and historical atlases in sets are also known in our country. To say an example for how much variety can be seen in map making, I mention that during our sojourn abroad the map of the Moskva area prepared specially for anglers and hunters was finished. The map illustrates very alluringly what kind of fish and in what concentration can be found in the separate segments of the river. The map also marks the various game with different signs. They plan that similar maps will be made of the major areas of hunting and angling in the U.S.S.R.

The supreme authority— the GUGK—will execute its above discussed tasks through the following organs under its supervision:

1. AEROGEODETIC OPERATIONS. Generally, operations with mixed activities, which in the form of enterprises perform the trigonational, countering, and astronomical measurements, and, up to 1:5000 - 1:100 000 scale, the geodetical, topographical and cartographical works until the design of a fair copy. The reproduction of the maps is already some one else's work.

2. The SCIENTIFIC MAP PLOTTING INSTITUTE executes the plotting of the various maps and atlases, and their editorial preparation. The activity of our Cartographic Enterprise, of course in a much smaller scale, has some resemblance to it.

3. The CARTOGRAPHY FACTORIES do the reproduction of the maps of various scales. Here will land the material prepared by the Map Plotting Institute and the lower geodetic enterprises.

4. The training of the middle cadre is done by the supreme authority in its own TECHNICAL SCHOOLS. Here, technicians of geodetics, photo-topography and cartography are instructed.

5. The GUGK also has INSTRUMENT FACTORIES. Here, geodetic, photogrammetric, and cartographic instruments and equipments are produced. In addition, geodetic instruments are produced wholesale also by way of the various industrial ministries.

6. The Scientific research work is carried out in the CENTRAL SCIENTIFIC RESEARCH INSTITUTE(CNIGAIK). The investigations of the institute include the fields of the lower and upper geodetics, topography, photogrammetry, cartography, and press works. The institute elaborates the detailed technical directions. With the knowledge of the ready technologies, the enterprises have only to execute the work. The new types of instruments are also tested out in the laboratories of the institute. The preparation of the new instruments for serial production is also the task of the institute.

7. In the CENTRAL GEODETIC AND CARTROGRAPHIC COLLECTION OF DATA the more important geodetic and cartographic basic data are preserved. The here preserved data (for instance: coordinates, altitudes) may be also obtained by alien organs.

8. The control of the work of geodetic and cartographic organs belonging to the supervision of other ministries is done by independent geodetic control departments organized within the local authorities of the Ministry of Interior. In the area of the Soviet Union there are 16 control departments, mostly independent from the administrative boundaries of the Republics, with proportionate division of the areas. In addition to the control of the works of the alien organs, these departments do the registry of the changes and the information service.

The direction of all these organs is a great responsibility. For the provision of direction by specialists and of the activities of other official nature the supreme authority has the following divisions at its disposal:

I. The topographic and geodetic division directs and controls the work of the low-geodetic operations. It serves two purposes. One is the control of the quality of works. The control is done by the technical controllers by randem sampling. This does not replace the control made by the enterprises themselves for all phases of the work. Often it also happens that the control is made at the request of the enterprise, especially then when more difficult tasks have to be performed. The controllers generally have greater experience than the engineers of the enterprise; thus, they often can help with advices.

The other task of the division is the dispatcher service. For each two operations, one dispatcher watches the fulfillment of the plan of the enterprise. The dispatcher aids the enterprise in planning, in affairs of supply with cadre, with finances, and materials, and essentially the dispatcher guarantees the liaison between the operation and the other divisions of the GUGK.

II. The CARTOGRAPHIC DIVISION directs and controls the work of the Scientific Map Plotting Institute and of the map-making factories. Outside his duty hours, the dispatcher also helps in the map plotting.

III. The GEODETIC SUPERVIROY DIVISION will control— through the already described local geodetic control departments— the works of the geodetic organs of other ministries. It permits the execution of the more important works, and finally it receives them.

IV. The TECHNICAL DIVISION has many and important tasks; hence, the division employs engineers of long practice and with wide knowledge. The most important task of the division is connected with the problems of technological development; thus, it directs the work of the research institutes and of experimental laboratories, it elaborates the technical instructions, it takes care of the introduction of new methods, it supervises the technical plans of the more significant geodetic works, and controls the work of the geodetic publishers.

V. The PALLNING DIVISION.

VI. The FINANCE DIVISION.

VII. The PERSONNEL DIVISION.

VIII. The TRAINING DIVISION.

IX. The GENERAL ADMINISTRATIVE DIVISION handles the affairs of the secretariate, of administration and correspondence.

X. The MATERIAL SUPPLY DIVISION.

The preparation of the basic networks as well as of the maps on 1:25 000 and 1:10 000 scales means such a gigantic work for the GUGK that it ties up its force fully and it cannot satisfy the special demands of other ministries. Hence, other ministries also have smaller or larger geodetic sectors at their disposal. The other ministries carry out their special land surveying tasks with reliance upon the basic data loaned to them by the GUGK, and under the control of the GUGK. Thus, for instance the surveying organization of the Agriculture Department was arranged in the framework of the Crop-Rotation and Land Management Chief Directorate. While the GUGK is making only contour-lined 1:10 000 map, the surveying organization of Agriculture also prepares maps without contouring. The town surveys, in 1:2000, 1:1000 or 1:500 scale, are performed by enterprise pertaining to the Ministry of City and Village (Rural) Economy. The surveys for the irrigation, mining, building industry, etc. are also prepared by organs belonging to the interested ministries. Even the Defense Ministry has a Military Topographic Chief Directorate which provides the solution of the special military cartographic tasks, but it is also included in the works of the 1:25 000 scale surveying.

The trend of development is that the whole-sale work of other ministries should also become more and more a central task. The unification was hitherto realized in the field of standards, instructions, and control. This unification is assured by a strict obligatory reporting system. The control of the work of other ministries is the task of the regional geodetic control departments.

The method of control is regulated by decisions and instructions. The control is executed generally with regard to the following main viewpoints: 1. application of correct method of work; 2. the quality of work; 3. the billed price; 4. the need for the work.

For the performance of works defined in the instruction, one has to get permit from the control department of the pertinent geodetic division. Generally, no license is needed for a work of small dimensions, or for such works by the performance of which no new, otherwise also utilizable geodetic-topographic data are established, for instance, the staking of a railroad curve, measurement of the sinking of a building, special measurements within a plant, and so on.

After a preceding investigation, the control department permits the work, and give all known data related to the pertinent area. The preliminary investigation also includes whether there are appropriate experts available at the applying organ for the performance of the work.

The importance and simultaneously the responsibility of the controlling right of the GUGK is perhaps best emphasized by the fact that, without the approbation of the control departments of the GUGK, the organs of the alien ministries do not get money for the execution of surveying works. Even the bank gets a copy of the permit, and it will pay so much and at such a rate as it was determined by the control department. Even at the control done during the work performance, the control department has the right to veto the financing by the bank. I think this is one of the most significant among the rights of the GUGK.

At the end of the works, the organ which did the work is obliged to deliver to the Data Collection Center the coordinates of the horizontal and vertical cardinal points and the original survey's plotting charts in case of more significant works. The 1:2000 survey plotting is not to be delivered if it is smaller than 3KM^2; neither is delivered the 1:5000 road if it is smaller than 10 KM^2, and the 1:10 000 road if it is smaller than a section. These parts of the work are preserved by the organ which does the survey, but if later the data are needed for other surveys, then these have to be also made available. The information is given in this case also through the local organs of the GUGK.

From these it is obvious that in the Soviet Union a geodetic and topographic work is being conducted which is proportionate to its huge area. Both the GUGK and the survey organs of the other ministries have many engineers and technicians at work on these tasks. This great need for experts could be fulfilled through the instruction courses at universities and technical schools.

In the Soviet Union, three such high schools are operated (at Moskva, Novosibirsk, and Lvov) where geodetic specialists and cartographers are educated. They have three faculties each:

1. the astronomic geodetic faculty,
2. the aerophoto-geodetic faculty (Here are trained the engineers engaged in the lower geodetic, topographic works);
3. the cartographic faculty, with branches of editing and publishing.

In addition, experts with high school (university) graduation are coming from the polygraphic high schools and from the optical mechanical faculty of the Moskva University. At these high schools, engineers for printing presses, respectively constructors of instruments are trained. At the technological high schools the geodetic instruction is encyclopedic.

Application for the high schools can be made after graduation from a ten-grade general school and after a successful entrance examination. The situation is similar to ours in that circumstance, too, that in the last years in the Soviet Union many are the applicants for the universities and high schools. Even at the geodetic specialties, one vacancy is usually applied for by 4-5 persons.

Generally the study course takes 4 years and 10 months, at the optical mechanical faculty it takes 5 years and 6 months. The study course also includes the time of the obligatory special exercises. Generally much value is put upon the practical instruction, which is obvious if we look at the distribution of the study time:-theoretical classes 30%, laboratory or practical training 35%, exercises in production 35%. The production exercise for each grade is during the summer subsequent to the class instructions. Hence, even the annual vacation time is shifted to the period from 15 August to 6 October.

The students of the final year are obliged to participate at a 4-month production exercise. They spend this time at some enterprise of the GUGK. Their work at this production exercise is evaluated. They get a mark for it which is taken into consideration— after receiving their diplomas— at their getting employment. After the preparation of the plan for diplomas, a diploma is given only to those who had performed the production exercises with at least a "good" mark.

The graduates of the high schools are each year distributed by a commission. According to the possibilities, the requests of the students are considered, but they are not always satisfiable. Generally, more of them would like to remain in large cities, while at the eastern areas, at the new industrial regions, geodetic experts are badly needed. According to the demands of the interested organs and the State plan, the commission will distribute the new specialists. If thereby someone would get an employment contrary to his wishes, after three years he may freely choose his working place.

At the training of the technicians, the specialization is still more expressed than at the high schools. Thus, technicians are trained separately in geodesy, topography, aerial photography, polygraphy and map printing. A single technical school usually has several branches. Many are the technical schools in the Soviet Union, and they usually function in the larger towns.

One may matriculate for a technical school after graduating from a 7-grade or a 10-grade general school. Accordingly, the study course lasts either 3 years and 9 months, or 2 years and 6 months. Those who graduated from a technical school, after 3 years' experience and with the recommendation of the enterprise, may continue their studies at universities.

Great value is attached in the technical schools to the practical instruction. 60-70% of the classes are practical. Moreover, each study year there is a 2-month production exercise, and in the final year of study a 5-month exercise. During this exercises, the students are living in tents, and working generally under such conditions as they will also later on often live during the performance of their profession.

In addition to the regular training, there is also a correspondence course at both the university and the technician's training. The study year is 5 years at the high school, 4½ years at the technical schools. Everyone is admitted to the correspondence course without any age limitation. Here also, the student has to do the same exercises as at the regular training course, and he will receive a diploma which is of equal value with the diploma of the regular course.

According to the needs, in addition to the systematic training for specialties, assistant technicians are also trained at courses of study. This is nowadays still necessary because the technical schools are unable to take care of all the demands. At present, in the Soviet Union, three times as many technicians graduate yearly as engineers, but according to the demands a ratio of 4:1 would be better. The bulk of the masses of requests are done by the technicians, even at the higher level of computations and observations; the engineers are the chiefs of the bureaus, divisions, expeditions, and teams as well as the directors of scientific research and control.

The instruction is free, moreover the good students are even given scholarships. The size of scholarship depends upon the progress in the studies and upon the study grade; it is 300-600 roubles monthly at the high schools (universities), 300-500 roubles at the technical schools, and 200-250 roubles at the courses.

It is likewise natural, the same way as in our country, that, in addition to these there are many more facilities in the Soviet Union for the postgraduate training. Social organs and factories are arranging postgraduate lectures. The higher level of postgraduate instruction is taken care of by the GUGK. It invites yearly for a 3-month study course those who are suitable among the workers of the special fields. Moreover, the obligatory postgraduate instruction during the winter months became systematized at the enterprises. This used to consist of 2-3 hours of lectures. For the time of postgraduate studies, the worker received his wages; this was already guaranteed in the expense account of the enterprise.

In our country, before the Liberation, men were exclusively engaged in geodetic work. Women could get a working facility only as draftsmen. Since then, the situation has changed; at the city surveys, at topographic works and elsewhere also, many a woman showed her ability. Since in this question the opinions are still divergent, I was much interested what the situation is in the Soviet Union. In the practice, we met at several places female division chiefs, a female director in a technological school, etc. The Laws give a chance

everyone to select the vocation he likes; in this respect there is no difference between man and woman. Yet, due to the nature of the works, the distribution cannot be identical; this can be steered only at the admissions to the high schools and technical schools. Hence, we were about to look into this problem mostly in the composition of the students.

Generally, 60% of the students are male, 40% female. At certain specialties, the deviation from this ratio is great, because at the cartographic and photo-laboratory specialties 90% of the students are female, at the aerial photography branch the students are 100% male. The ratio of 60%:40% is mostly found at city surveying and in topography. According to our experience, women were mostly outstanding at the computations. In our opinion, at the topographic surveying, where the work at site takes much physical endurance, where they have to live in tents, far away from inhabited places, etc., it would be desirable to modify the percentage ratio to the advantage of males; yet, they cannot do this, because there are not enough male applicants.

In the practice also, this was found by us as the existing ratio. In the scientific research, about one third of the staff was female, at the map editing about one half, at the photogrammetric division, at the mounting, at the fair copying, however, almost 100% of the employees were female. Even at the field of cartography, the editors, the compilers, the shapers are female in a bulk, however the photographers are all males. The administration of the enterprises and institutes;-the directors, chief engineers and division heads are all men.

It is certainly interesting to know the wages of the Soviet geodetic workers. The most fundamental characteristic of their wages system is that it is uniform, and obligatory for all organs without exception. It can never happen, as it does with us, that the same work is differently paid at another agency or organ, or the standards would be different. The most general is the payment by results (task wage). About 85% of the workers is working according to this system, but there is also a premium time wage, too, about 13%, and a flat time wage (payment by the hour) 2%. The uniform instruction and standard takes care of which work should be performed according to which wages system.

Everyone has his own basic classification, even though he works for wages on results. This is important therefore because the basic classification also expresses the evaluation of the worker. Hence, every year, after the evaluation of the performed work, perhaps after a discussiom with the interested person, the worker is again classified. The basic classification is moreover important for the workers of task wages in case of the daily allowances at time of works at site, and at the payment of wages which is due to them for waiting when this was not their own fault. Namely, if someone is unable to produce when he cannot help it (e.g., due to bad weather), he gets 50% of his basic wage for the time of idleness.

The most universal form of wage payment, which is applied at works at site, at computations, editings, and even at some operations in the Research Institute and at controlling works, is the wages by results without any upper limit. Most of them do not much exceed the 100%, but we have also found 180-200% achievements of the standard, and even 350% at the cartography of the fair copy. At one of the larger geodetic enterprises which we visited, the work production of the first semester of 1956 averaged 130%.

The standards are time standards; they indicate the time required for the performance of individual works. There are such works which have to be done in brigades, by several persons (e.g., construction, longitudinal measurement, etc.); here, everyone will get the percentage of the brigade at time of classification (at recruiting). As members of brigades, the steady and the locally acquired physical workers are also paid by task wages.

In the book of standards the works are also classified, that is, it is indicated what type of work should be done by what class of worker. This is mostly adhered to, but it happens, that someone will do a lower or higher category of job than his classification would require. If he properly finished the higher category work, then for that time he will get the basic wage of the higher category, with the achieved percentage of standard. If for some reason he has to do a job requiring lower education, even then he is not treated badly, he will get the percentage of standard according to his own higher category.

The standards of the works at site have been prepared for a 7-hour workday. In the field, there is usually more work done than this; this could not be even controlled and supervised; hence, in field works the achievements by standards are higher. Generally, the standards are tight, they can be fulfilled by systematic work only.

The young specialists who just come from the high schools and technical schools are working for three months according to the wages by time system until they appropriate the working methods. It happens that the more skilfull ones will request before the end of the three months to be permitted to work in the task wages system. We have not seen such a case that the newly recruited young specialists would cause any problem in the fulfillment of the plan by the enterprises. This is impossible since both in the university and the technical school's instruction the requirements of production are the first. The students are doing their exercises under conditions wholly identical with the work of production, and after they entered the practice, very soon they will be also able to achieve the standard.

Those workers whose work is related to the production but whose achievement is not directly measurable, will get a premium wage by time. Here we find the workers who are entrusted with doing other special works, and/or who are the directors of the enterprises, heads of divisions or groups, leaders of workshops, technical controllers, scientific research workers. The specifications of the premium are established separately for each enterprise, yet the fulfillment of

the plan, the quality of the accomplished work, and the fulfillment of the plan of self-expenses are always found among the stipulations. The most important stipulation is the fulfillment of the plan. Premium is already paid at a 100% fulfillment. Thus, in the geodetic enterprises the premium is 16.5%, and after each % of excess over the fulfillment of the plan, 2.2% more is given in premium. There is no upper limit for the payment of premiums, but due to the strong degressivity, a premium above 60% is rarely found, mostly it is 30-40%.

Plain wages by time are paid only to the personnel of administration and to the helpers, such as typists, accountants (pay clerks), bookkeepers, janitors, etc.

In addition to the wages for the work, the workers at works at site are also due to some other allotments. If the worker provides his own ledging, then he will get 90 roubles per month for it. The experience is that lodging can be obtained even much cheaper. The lodging allowance has not to be accounted for, everyone can keep the saving. The system of wages by days differs from ours; it is larger, and is connected with the basic classification. The technicians get 60% of their base pay, the administrative workers, 40%, and the auxiliary workers 25% as wages per day. Of course, in addition to this, all certified material expenses, such as travel, lodging, etc., which are connected with the performance of the work, can be put on the expense account.

The field works (works at site) of the Soviet geodetic experts and topographists are usually at great distances from their residences; hence, they have no way even to come home frequently. Usually, they return home after finishing the summer work, and they spend only the winter months at the center, when they deliver to the team of elaboration the finished survey work, and they prepare the task of surveying for the next year. Most of them are glad and happy to take this work, partly even for the reason because they are better off in material respect than those who work inside. This is due to the larger standard wages and to the high daily allowance. Many of them will also take their families in the summer months, and thus even the vacation of the children is solved. This is also the explanation for why the topographers will take their annual leaves in the winter months.

The annual leave is given in one continuous length; the field surveyors are due to one month vacation, the bureau workers to three weeks. Moreover, the field workers will also get the days which sum up from the shorter working days before Sundays and holidays; this is so because in the field they could not enjoy this privilege. The directors may take their vacation also in several portions (all together 24 working days). They receive during the vacation such wages as based upon the average earnings during the previous three months. The same is due to them also during sickness.

Finally, let us say a few words about how the enterprises are organizing their surveying works. The enterprises of the GUGK do not conduct small works. The tasks to be done are already known in the previous year. After the enterprise received the task from the GUGK,

it prepares a detailed plan for its execution. During the year, the working teams have already nothing to worry about; transportation, material, manpower is already planned, and they obtain it according to the schedule. The enterprise distributes the task among its divisions. The enterprise has a triangulation, contouring, topographical and astrogeodesical division. If the scale of the work requires, then not the divisions, but a specially organized expedition formed for this purpose will carry out the work. From the aspect of accounting and organization in the enterprise, the expedition is at the same level with a division, but it is dispatched to the site of the survey. The expedition is further divided into 4-5 groups, and each group into 5-6 brigades. With such an expedition, there is an administrator, a supply officer, etc. right at the field. The director of the expedition is responsible for the work, qualitatively as well as materially. From a financial aspect, the expedition is treated as a self-accounting division; even the workers will get their payments here. The organization of a single expedition may be kept on even for several years, until the work has been finished. From its own motor trucks the enterprise detaches some to the expedition according to the needs, but this is usually not sufficient, they also used to rent horse-drawn cars or motor trucks from the kolkhozes. There is an established schedule of tariff by regions for the transportation; the requisition used to be done through the county councils (soviets). Generally, no difficulty used to be encountered in this respect. Their equipment with instruments and with other tools is usually good.

The office treatment of the works submitted either by the separate divisions or by the expeditions is done by so-called laboratories and workshops organized for this purpose (photogrammetric laboratory, computing laboratory, photo laboratory, mounting shop, stereo-photogrammetric and cartographic laboratories, etc.). In these laboratories the work is so much organized that they are able to treat a very large amount of work as if on the assembly line. The workers are mostly specialized for the performance of single tasks. This system of working requires accurate organization, precise observance of the deadlines, due to the connection with the work of the shops, but it is undeniable that much can be accomplished this way.

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THE PROBLEMS OF CZECHOSLOVAK CARTOGRAPHY

/1958, No.2, p.152-153/

Alexander RADŮ

In July 1957, the Czechoslovak Geographical Society held its seventh congress in Brno. Here, cartography played a significant role. Karel KUCHAR, lecturer of the Charles University at Praha, had a clear account of the present works and problems of Czechoslovak

cartography. Since his lecture contains also many interesting data for the Hungarian cartographers, we treat it in detail on the basis of the No. 3, 1957, of the "Kartograficky Prehled" (Cartographic Review).

First the lecturer brought up the problem of contraction (generalization which is also an important problem in Czechoslovak cartography. According to him, the deficiencies in map contraction can be blamed upon the fact that specialist geographers are not included in the work of generalization and that in the Czechoslovak map production no possibilities are open for making a map all newly elaborated from beginning to end, because the maps are frequently the copies of alien map sheets, and finally, that the generalization must be done not from merely scientific points of view, but on the basis of the publisher's concepts, often within very narrow limits.

But even the successful solutions— especially in the field of generalizing the relief of the terrain—have only a theoretical importance if they are not harmonized with the facilities of the technic of reproduction.

By all means, the generalization should not become a formal task of designing, but it must be done with the guidance of the geographers so that it will emphasize and express what is important from the geographical aspect.

In Czechoslovakia the role of the geographers is still very slight at the map making, whose main reason is that either only geographer pedagogues are coming out from the universities without any cartographic training, or cartographic engineers without any geographic training. (It is well known that in Hungary a similar problem existed, and only in the last few years could we remedy the most crying troubles).

Further on, Dr. KUCHAR reported about the present state of the cartographic terminological dictionary now under compilation. The dictionary in Czech. resp. Slovak languages is compiled by the cartographic group of the Czechoslovak Academy of Sciences and the pertinent chairs of the Charles University. The manuscript will be ready in 1958. For each entry, in addition to the definition and to the Russian, German, French and English translations, they will give the etymology of the word, moreover a brief explanatory article will be attached so that the dictionary will be actually a cartographic lexicon. (The publication of such a special dictionary in the Hungarian language should be also considered).

The Hungarian cartography is especially concerned with the affairs of the second edition of the Czechoslovak "Monumenta Cartographica". It is known that the first edition was published in 1938, before the Second World War; the second edition, which will consist of 75 sheets, that is, the double of the first edition, is already in a condition ready for printing, and will come out in 1958. In contrast with the first edition, which included the maps of Behemia only, the new edition will embrace all parts of Czechoslovakia, which is also expressed by its title: Monumental Cartographiae

Bohemiae, Moraviae, Silesiae atque Sloveniae (elim partes Hungariae superioris nonoccupatae), i.e. Cartographic Monuments of Bohemia, Moravia, Silesia and Slovakia (once parts of non-occupied Upper Hungary).

On connection with this, Dr. KUCHAR said the following: "To make the foundation of the Slovak part of the "Monumenta" at the analysis of the maps of Slovakia we have also consulted the authors of other nationalities. For instance, an article was written by the reviewer on the map of Clerk-Lazar (Sbornik ceskoslov.spolecn.zempiesne, (:Review of the Czechoslovak Geographical Society) No. 2, 1957)."

The new edition of the Monumenta will include the following maps of Slovakia by the following authors: Lázár (1528), Lazius (1552), Lazius and Sambucus from the atlas of Ortelius, Stier (1664), Hevenessi (1689), Johna Christian Müller (1709); it will also contain the county maps published by Mathias Bél from the works of Mikovinyi (maps of the counties of Pazsony, Nyitra, Hont, Turóc, Liptó, Zólyom and Nógrád), moreover the work of Mikovinyi entitled "Vestigium operationis astronomic-geometricae" (:Astronomo-geometrical research works). Thereby, the monuments of Slovakia's maps are also closed in the second half of the 18th century, since in the following era of the military map making we do not find any more whole collections of maps. As it is evident from this enumeration, the part of the Monumenta related to Slovakia, which will include 15 maps altogether, will be a very important source work for the Hungarian cartography.

Certainly, the Monumenta Cartographica Sloveniae, planned by Dr. PURGINA, will be still richer in Hungarian relations; this will be compiled by Slovak scholars. The same can be also said of the monographic series entitled "The masters of Slovak cartography" /Tvorcovia slovenskej kartografie/ to be published as the execution of the decision of a previous geographical congress; its first volume was devoted to the work of Samuel Mikovinyi.

In the second half of the 18th century— during the rule of Joseph II— a military survey was finished which shows Czechoslovakia at a 1:28 000 scale on 750 sectors of the charts. Of these, 300 sectors are of Slovakia, which as well-known was a part of the Hungarian Kingdom at that time, so that these sectors contribute important data for the history of Hungarian cartography. In the Czechoslovak State Archives, the photographs of all these map sheets are now collected together, thus they are easily available for research.

Recently, the Czechoslovak cartographic science is also interested in the 19th century second military surveying. For us particularly interesting is the work of HORÁK on Joseph HOMOLKA, Czech cartographer who performed his activities among the Hungarian cartographers. At the 50th anniversary of the death of Homolka, Dr. KUCHAR recalls that the public meeting of the Hungarian Geographic Society has celebrated Homolka as a prominent man in the specialty while he was still alive.

The account also touched the publishing plans concerning the school wall maps. These will be partly continental maps of economic geography: Europe in 1:3,5 million, Asia and Africa in 1:6 million scale; on the other hand, historical will maps, among which the first will be the map of the Second World War, the second will be the map of the class wars of the 15th - 18th centuries in a scale of 1:3,5 million.

In addition to the school wall maps, for the general public the following wall maps will be ready: (in 1958): -political map of the world 1:30 million; Austria 1:1 million, Benelux states 1:1 million; the Soviet Union 1:6 million, China 1:6 million, the liberation of Slovakia 1:500 000.

In the same year will be published the tourist maps of the Czech Central Mountain, of the Iser Mountain, the Morva Karst, the Small Carpathians, the Big and Little Fatras, the maps of the Kisuca mountainous regions, all of them in 1:75 000 scale, in 30-40 000 copies; furthermore the map of Brno city in 1:15 000 scale, and of Kassa city in 1:10 000 scale. On the maps for tourists, the hitherto used bird's eye-view representation was changed to purely countour-lined representation, yet so that it does not show the plasticity of terrain relief. The traditional rigid adherence to the 1:75 000 scale was no help either in increasing the legibility and usefullness of the tourist maps.

Dr. KUCHAR finally turned to the problem of names' writing which—apparently— is just the same headache for the Czechoslovak cartographers, too, as for our specialists. The nomenclature commissions for geographical nouns organized at various agencies were still not able to establish generally valid rules, although lately considerable improvement and progress could be seen. For the area of Czechoslovakia, in the framework of the 1:75 000 map, the nomenclature has been elaborated. Now, they prepare the list of place names in Czech and Slovak languages, which will include the standardized style of spelling for 35 000 foreign names in alphabetical order. The greatest problems occurred at the spelling of geographical nouns of Asian and African peoples, since the geographers are here propagating the phonetic form of transcription, but the daily news and the radio's operation has not much favored this.

Dr. KUCHAR's account, even in this report, shows that the problems of the Czechoslovak and Hungarian cartography are not only similar, but in many respects also identical. It is time to devote more attention to this problem not only at the technological but also at the scientific theoretical level of cartography and to exchange our experiences.

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GEOMORPHOLOGICAL MAPPING IN THE SOVIET UNION

/1958, No.3, p.222-23/

Alexander RADÓ

The Ministry of Geology and of Mineralogical Treasures of the Soviet Union, with its 1955 directive concerning the state-wide standard geological surveys, set the goal for a systematic geomorphological survey of the area of the Soviet Union. This uniquely large work of science will be the roof upon the gigantic development of the Soviet geomorphological cartography. For its execution it was necessary to standardize the principles and methods of geomorphological map making. For this purpose the Ministry of Geology, together with the Geological Research Institute of the Soviet Union, arranged a geomorphological cartographic conference at Leningrad in April 1956. It is characteristic for the geomorphological cartography's dimensions in the Soviet that on this conference 33 scientific and productive organs participated with a total of 190 participants.

On the part of the Geological Institute, G. S. GANYESIN gave a clear account of the Soviet geomorphological maps, and he emphasized that the greater number of these maps was made on the basis of the morphogenetic principle, i.e., their contents reflects the origin of the different elements of the terrain. Opposite to this principle, only a few geomorphologists hold it necessary to indicate on the map first of all the age of the various hypsometric levels and surfaces. Yet, the overweight of the morphogenetic principle does not mean that a standardized key of signs was introduced into the geomorphological map making. On the contrary, the most varied methods of representation (surface coloration, linear signs, etc.) are used.

The developed discussion showed first of all that at the various regions of the Soviet Union the geomorphological mapping activities are wide-spread. It is of special interest to look at the work of the Aerological Trust of the Soviet Union which, at the plotting of the geological and geomorphological maps, will chiefly rely upon the aerial survey and upon aerial observation. In this type of work of the Geographical Institute of the Soviet Academy, the regional geomorphological maps of large areas are of special interest, thus the maps of the European part of the Soviet Union, the maps of the Caucasus, and of the Kara-Kum Desert. The representative of the Grusian Geological Directorate announced that the 1:500 000 map of geomorphology of the entire Grusia has been finished, and that such maps were also prepared at the 1:50 000 - 1:200 000 scales of a considerable part of the country. An interesting topic was introduced by the Uzbek Geological Directorate in connection with the mapping of the Western Tsiensan mountainous regions. Namely, on these geomorphological maps, in addition to the morphogenetic types, the so-called "terrace valleys" are also represented which correspond to the great periods of the erosional articulation of the

country. (Under the term "terrace valleys" the Soviet scientific literature understands the erosional accumulative surface of the ancient river terraces, together with the pertinent slopes). On the background of this surface of different ages the concrete types and formations of the terrain are shown.

In his account describing the geomorphological cartography abroad, the representative of the Moskva University, A. I. SPIRIDONOV, emphasized the importance of works performed in the Polish People's Republic which in many respects are done in accordance with the principles of the Soviet map making. We remark that Poland was the first to organize (already in 1950) the geomorphological systematic survey of the whole country to be conducted according to standardized instructions.

The conference devoted the greater part of its time to the problem of geomorphological classification and of the key to signs to be used on maps. On the basis of the material in the literature and of many years experience, BOCH and KRASNOC, representatives of the Soviet Geological Institute, have elaborated and submitted to the conference the classification of the surface elements of the terrain. They proposed the following taxonomic categories:- continent, geozone, geotecture, metamorpho-structure, morphostructure, type complexes of relief, types of relief, subtypes of relief, microtypes of relief. This nomenclature is based upon the categories established by I. P. GERASIMOV, celebrated Soviet geographer. These categories are in connection with the scale of the map. On outline maps of scales smaller than 1:1 500 000, the metamorphostructure and the morphostructure are representated while complexes of relief are in the foreground. On maps of 1:100 000 - 1:200 000 the morphogenetic types of relief form the main contents of the map. The larger the scale becomes, the more the map will reflect the relief elements of exogenous origin, and the less it shows the elements related to endogenesis. The most difficult task for mapping is on the maps scales 1:100 000 - 1:200 000 the representation of relief elements evolved from the complicated interaction of endogenous and exogenous factors. This proposal dealing with categorization also treated the questions of geomorphological terminology which also occur in our country, thus the definition and demarcation of such used terms as plane and lowland, plateau and highland, etc.

Finally the proposal rejected the same standardized sign-key for geomorphological maps of all scales, yet it found desirable to use such standardized key for the separate groups of scales (large, medium and small scale).

Several other lectures discussed such a sign key which would be most suitable for certain scales. The Geographical Institute of the Soviet Academy of Sciences demonstrated the plan for the sign key for geomorphological maps at scales smaller than 1:100 000. On these maps the chief method of representation is the surface coloration which distinguishes the genesis of the relief, i.e., the morphogenetic types, while the morphographic features, i.e., the relief

formations are represented by out-of-scale signs and contour lines. The age of the various morphological elements was suggested to be indicated by index numbers. In the sign key the representation of tectonic phenomena will also find its place, among them the most recent tectonic movements and the internal geological structures.

A geomorphological research team of the Moskva University has elaborated the sign key for the large-scale (1:25 000 and 1:50 000) geomorpholotical maps. There are 112 colored signs in it for the surface coloration of the relief forms and elements, moreover 256 linear marks. The colored background shows the genetics of the relief form, while the grey hachure in the colored background gives information about the composition of the loose (detrital) deposit. The most recent tectonic movements and the thereby evolved forms, furthermore the volcanic forms and relics of ancient structures are proposed to be marked with separate red and white signs. Here again the age will be marked with index numbers.

The fewest number of people discussed the question what should be shown on the geomorphological maps by surface coloration, i.e., by the most expressive method of cartographical representation:- the genesis or the morphology or the age of the relief elements. While the age, as the least characteristic element, was not taken into consideration, the opinions differed as to the morphology and the genesis. Finally the Conference proposed that the representation of the morphogenetic relief elements (type, form, form elements, and other taxonomic categories) should be done by surface coloration.

The Conference decided that a committee will be formed at the Geological Institute of the Soviet Union whose task is the elaboration of the standardized sign keys for the State geomorphological maps, the reform of geomorphological terminology, furthermore the approbation of instructions and methodological handbooks related to the geomorphological surveying and the plotting of geomorphological maps.

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CONFERENCE ON PHOTOGRAMMETRY IN THE SOVIET UNION

/1958, No.3, p.224/

Alexander RADÓ

In the beginning of 1959, at Leningrad, in the arrangement of the Soviet Academy of Sciences, after a gap of ten years, the Seventh All-Union Photogrammetric Conference was held. How great an importance the aerial photography acquired in the Soviet Union we can see from the fact that 248 scientific bodies with 800 representatives participated at the conference. In addition to the 34 referates of the plenary session, the six committees which functioned at the conference have also listened to and discussed 75 other accounts. The comprehensiveness of the working sphere of the committees is also characteristic:- 1. geology, 2. geomorphology, 3. geobotany, pedology and hydrology of

land, 4. hydrography of sea, 5. photography and photogrammetry, 6. engineering researches. For the cartography the most interesting was the lecture of A. I. BULANOV, the representative of the Soviet Geodetic and Cartographic Bureau who is also well known in our country; he made a report on the importance of aerial photography in the 1:100 000 scale map plotting of the Soviet Union. This map will make possible the plotting of maps at smaller scales. On the basis of this map, they just finish the amended edition of the 1:1 000 000 map. In his remark, G. V. ROMANOVSKY pointed out that the evaluators of aerial photographs must work with the simplest devices. For the transformation of the photographic maps the Soviet geodetic experts have an adequate tool at their disposal in the form of the transformator of KOLONTAROV and ZHUKOV. FINKOVSKY reported on the new stereo instrument which is employed at the aerial photogrammetric plotting of large-scale maps. There were also lectures at the conference about the use of aerogeophysical methods in the geological researches and surveys, on the aeromagnetic survey for plotting of geological maps, on the employment of the material of photogrammetric findings in the geomorphological researches, on the evaluation of aerial photographs for geobotany, especially in the search of subterranean water sources over areas of dry climate; they discussed the utilization of the aerial methods in the plotting of soil maps and marsh typological maps, for forestry research, in railroad construction, in measurement of the depth of seas and in echometry.

A. G. VOROB'OV, of Leningrad, called attention to the use of balloons. According to him, these have many advantages above the airplanes and helicopters in regard to aerial photography and visual observation from the air.

Several accounts dealt with the new instruments, among others F. V. DROBISHEV discussed his new stereophotograph. The Conference separately treated the question of preparing adequate cadres, and finally it decided the foundation of a Soviet Photogrammetric Association at the geological geographical division of the Soviet Academy of Sciences.

CARTOGRAPHY AT THE 18th INTERNATIONAL CONGRESS OF GEOGRAPHY

[1958, vol. 10, No. 3, p.224-225]

Alexander RADÓ

Generally, cartography was always in the foreground at the international congresses of geography, and many an important cartographic initiative was born at geographic congresses. Thus, the 1871 first congress at Antwerpen put on its agenda the question of the standard basic meridian, which was agreed upon at the specially convoked Washington Conference in 1884 so that the meridian of Greenwich was designated for this purpose. The 1891 Bern congress

proposed the standard 1:1 000 000 scale world map. This remained a constant point at the agenda of the following congress, too, until finally with the establishment of a permanent bureau it was realized. The 1899 congress at Berlin decided the publication of the bathymetric map of the World Sea at a 1:1 000 000 scale. This was first published in 1904.

On the cartographic topics of the latest congress at Rio de Janeiro we have given repeatedly some information in this journal. In the No. 1, 1957 of the geographical magazine of the Soviet Scientific Academy, SALISHCHEV, professor in Moskva, and one of the participants at the congress, gave an outline of the cartographic relations of this congress; on the basis of this, we offer the following detailed information.

The topics of the geographic congress started traditionally with the opening of the cartographic section. At the earlier congresses, this Section also included geodesy; yet this practice was stopped after the foundation of the international geodetic organizations. At the Rio congress, the Section obtained the first time the title of "Cartography and Photogeography", by which the growing importance of aerial photography in cartography was given a recognition. The program of the Section grouped about three main topics: 1. new methods of cartographic representation, 2. utilization of aerial photography within cartography and geography, 3. methods of mapping the tropical areas. From the four lectures of the first thematic group the most interesting is the account of A. SESTINI, professor at the Firenze University on "Methods and examples of the simultaneous mapping of the facts of Nature and Society" in which he demonstrated his own trials of this nature on the maps of Italy and Albania. The second topic was discussed by six lecturers. The French M. GLORIOD, under the title "Aerial photography as the supplement and aid of maps" talked of the detailed comparison of the peculiarities and properties of aerial photography and cartographic representation. He found that the two may mutually supplement each other, and he especially emphasized their joint utilization in the study of geomorphology and the vegetative cover. The other French lecturer, RUELLAN, also discussed the experiences gained from the utilization of aerial photographs in the geomorphological mapping. H. BÖSCH, well-known professor of geography at Zurich University, reported how photogrammetry can be used successfully for small-scale (1:1 000 000) maps which are required for the development of the backward areas. The starting point of his other lecture was the known fact that at the evaluation of the aerial photographs the season of the photography should be considered. He photographed a part of Zurich at seven different times of the year, and on the basis of this he established standards for the evaluation according to the different seasons. A. SOLARI, of Argentina, also devoted his lecture to the topic initiated by BÖSCH (research of the economically undeveloped areas' natural resources by means of aerial photography), with the illustration of examples from the economically retarded areas of Argentina.

The single lecture of the third thematic group was held by the French V. J. M. BARRERE on "Mapping of tropical forest areas". He informed about the plotting of the 1:50 000 scale topographic map of French Guayana with the aid of aerial photography, of the large-mesh net of the astronomic points and of barometric measurement of altitudes.

Among the 8 lectures held outside the program the greatest interest was provoked by those which discussed geomorphological mapping. We have already reported the account of the Swiss ANNAHEIM (this journal, 1957, p. 191). M. KLIMASEWSKY, professor of the Wroclaw University, reported on the works of the geomorphological 1:50 000 scale map of Poland whose basis is the geomorphological survey conducted since 1950 in the country by the Polish universities and the Geographical Institute of the Polish Academy of Sciences. The sign key of the map includes 154 marks indicating surface forms, which give a full picture of the shape, genesis and age of the surface of the ground, and helps very much at the area planning and at the better exploitation of the grounds. The work has been already finished over an area of 74 000 Km^2, i.e., over a quarter of Poland.

In his lecture on complex geographic map making, SALISHCHEV professor urged the preparation of the world's complex map with an international cooperation. The success of this idea depends upon it that the works of the international atlases planned or published in the separate countries should be utilized. Hence, the Soviet delegation proposed that for this purpose a committee should be appointed. The proposal was seconded by the representatives of Poland and the Netherlands. Thus, the decision of the International Geographical Union was born about the establishment of such an international committee.

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INTERNATIONAL ORGANIZATIONS OF CARTOGRAPHY

/1959, vol. 11, no. 1, p.62/

Alexander RADÓ

Cartography as a separate science between geodesy and geography started its evolution in the last decades only, and therefore even now its international scientific organizational belonging is still not made clear. In this magazine we have already mentioned (1857, p. 186) the opinion of the International Cartographic Conference convoked in 1956 at Stockholm, according to which the International Cartographic Society, to be organized in the future, should embrace only those fields of cartography "which are not included in the work of the already existing organizations". This decision, which is indeed very loosely defined, reflects the fact that the cartographic societies organized at the West are working with the most different goals. Thus the Holland Cartographic Society was established as a section of the Holland Geographic Society; the Belgian cartographers

rely upon the so-called Europa Collegium, a political-sciences high school; the society of the French map technicians—as also that of the Swedish cartographers— is in close relation with their country's Central Cartographic Institute, and it concentrates attention first of all upon the technic of drawing and reproduction and upon the preparation of the copy for the printer rather than upon the contents of the map. This latter phenomenon, otherwise, stamped also the Stockholm conference, and the further activity of the program committee organized at this conference— which in the summer of 1958 led to another international cartographic conference at Chicago arranged by the American Rand McNally Cartographic Enterprise— was also one-sidedly including only the international comprehension of the institutions interested in cartographic technology. According to the latest ideas, this cooperation would temporarily refer only to Europe (i.e., the capitalistic Western Europe). Recently, even on the side of the thematic cultivators of cartography, an initiative for international organization became manifest. As a result of this, a so-called European Center of Cartography Research opened at Brugges. Under "Europe" we have to understand again "Western Europe", or rather "Capitalistic Europe", since this so-called "Carteurope" is an organ in close connection with the Europa Collegium at Brugges, which serves the interests of the West-European Union, European Common Market, European Coal and Steel Community.

To the confusion which is obsereable in the international organization of cartography it comes that, in addition to the intentions for the creation of purely cartographic international organizations, there are several older existing international organizations whose sphere of interest includes cartography, or a part of it. For instance the International Geographic Union has the following committees with cartographic topics:- library classification of geography books and maps; bibliography of ancient maps; national atlases; mapping committee for world's population. Similarly the International Federation of Geometers is also dealing with cartography; thus one of the committees of the Ninth International Geometers Congress held in 1958 at Delft has cartography for its topic. Also at the International Photogrammetric Society, a cartographic committee is functioning. The coordination of the international official cartography is the target of the U.N. cartographic bureau which is also the central organ of the "International World Map". As a coordinating organ of the sea maps, the International Hydrographic Bureau is functioning at Monaco. The International Civilian Air Traffic Organization is also doing a cooperative activity in connections with the publishing of the International Aeronautical World Map. We mention the Panamerican Geographical and Historical Institute as one of the largest regional organs whose activity expands all over the American continent.

It is remarkable that The International Geodetic and Geophysical Union does not centrally care for cartography, similarly not as the International Geodetic Society which is associated with it.

On the other hand, in the member countries of the Union which belong to the socialistic camp, geodesy is closely adjoining the cartography, both in the State and in its social relations. In the Soviet Union and in the other states building the socialism, geodetical and cartografical societies were formed which, although they do not have a peak organ, are more or less similar in the construction. The hitherto gathered experiences show that such an organization for cartography which would include all branches of map making, and its close cooperation with geodetics is the most proper organizational form, and already voices are heard even in the West which recognized the superiority of this organizational type.

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CARTOGRAPHICAL CONFERENCE IN MOSCOW

[p. 62-63]

Alexander RADÓ, Dr.

In December 1957, in the Geodetic and Cartographic Bureau of the Soviet Union, the directors of the cartographic enterprises and the scientific editorial staff of the Bureau held a conference on the status and future tasks of the cartographic industry. The Conference emphasized the improvement in the organization of map production. The 1957 plan was fulfilled by 114%. The maps and atlases are partly printed by the new procedures which use fewer basic colors. In the cartographic press at Minsk they started the use of the bimetallic printing plates. During the year of 1957, in place of the hitherto usual map supplements of the general school books, for all the 4th, 5th and 6th classes, geographical atlases were issued on the basis of the curriculum, and they prepared the school atlases for the 7th, 8th and 9th grades which pertain to the study course. The editing of the atlases was done with the approbation of the general public-school teachers at Moskva, the didactic council of the Ministry of Instruction, and of the interministerial editorial body of the school maps and atlases.

The publication of the Great Soviet Encyclopedia came to an end. And its scientific editorial board reports of the work performed for the Encyclopedia. Altogether 2500 maps were prepared for the Encyclopedia.

On the conference an objection was made that the scientific editorial body does not keep the datelines and that the workers of the Bureau do not sufficiently supervise the precise execution of the editorial schedule. It was stated that in the editorial office and in the cartographic printing shop the preparatory technology of the press is not standardized and that a great part of the map printing shops is working with an obsolete technology. The Central Scientific Institute (CNIIGAIK) does not give adequate aid to the map printing shops in the field of map publishing, and thus the cartographic printing industry does not have a scientific central organ which

would elaborate the new editorial technic and technology. The conference made decisions for the liquidation of these deficiencies.

In January 1958, as a supplement to the mentioned conference, a conference was held by the editors of the map enterprises and the scientific editorial board of the Bureau at which S. I. SHCHUROV, the cartographic editor in chief of the Bureau gave a reviewing account of the hitherto obtained results of the preparation of the general geographical and special maps, and pointed out that in the future the map editing will prepare essentially the publishing of the complex maps. Therewith a new period opens in Soviet cartography. The first works of the new sphere of topics are the complex atlas of the Soviet Union, the complex atlas of China, the agricultural atlas of the Soviet Union, and the complex atlases of the federated republics. Besides, of course, the general geographical and school atlases and maps will appear in a new, amended edition.

For the improvement of the editorial works the conference held it necessary to elaborate a 7-year program of topics. The yearly thematic plans have to be always submitted to the map enterprises in September of the preceding year. At the elaboration of the plans, the needs of the national economy and of the map readers are to be kept in mind. In the map plotting, preparation for printing and publishing, the foreign experiences have to be considered. The payment in the productivity wage system for the work of the map editors should be abandoned.

For increasing the quality of editorial work, the editors (plotters) must be made more and more responsible for the maps edited and planned by them. Each year the Bureau will arrange central courses for the editors on the plotting of the thematic and complex maps. The work of the Collection of Data must be improved in the compilation of the material of the thematic maps. For the reform of maps from esthetic and artistic points of view, more emphasis should be put upon the elaboration of colors, key to signs and lettering. For this purpose, a central laboratory is to be erected for the preparation of the letters of photo-composition and of the sign key. The newest technic should be applied in the engraving through transparent material (through "foils").

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EXPERIENCES GAINED AT THE MAP RENOVATION OF BARANYA COUNTY

/1959, vol.11, No.1, p.63-64/

Stephan AMBRUS

The problem in the work of map renovation is very different according to villages from both the aspect of accuracy and the method of execution. Practically with every village another instruction would be necessary. Hence it is correct that the AFTH (:Allami Fő Térképészeti Hivatal: State Chief Cartographic Bureau) has been issuing only the principles for the map renovating work, and the

method of execution has to be prescribed case by case in the technical plan related to the village. It is however necessary that, especially in the country, the AFTH should arrange more lectures, accounts and exchange of experiences, and, on the basis of experiences gained from the discussion of the working methods employed at the various places, it should modify the different instructions. On the basis of my own experiences, the given limits of errors can be observed.

The purpose of the technical plan is double. Its main purpose is in my opinion that, within the frame given by the principles and instructions,—on the different facilities of the village— it should give definite orders for execution for the workers performing the task. Yet, its purpose also is the good elaboration of the economic part, because in case of a bad computation of prices the work may be done with a deficit, while in case of above-quota production a wage tension may occur among the workers. The first purpose makes it especially justified that the technical plan should be prepared by an experienced worker. At the PGTV (:) the technical plans are prepared by the heads of the branches, respectively by those group leaders who direct the works of the village, who control them and who provide the internal examination of these works. The delay in the approbation of the technical plan should be remedied. It happened that one inspectorate of the AFTH took three months to approve a generally good plan.

I consider it a defect in the issued temporary standards that the excess work in the survey of linear field objects and ranches is not adequately represented in the standardized items. At the final quotas this should be taken into account.

It must be requested that the survey notes must be clear, legible, and generally understandable. We have three methods for the preparation of the survey notes:

1. From the cadastral map—and from the No. 10 law decree work— a tracing is made, and from this a photo-copy. With the insertion of the names and the scales, this will serve as the survey notes. The advantage of this method is that this way the notes are correct as to form. This is especially important for novice workers; its disadvantage is the additional expense for the tracer copy. This method can be used where the size of the details makes possible the good legible insertion of the names and scales.

2. Where, owing to the density of details (vineyards, pastures) the scale of the cadastral map does not make possible the legible insertion of the names and scales, there drawing papers serve as survey notes; they are made by the enlargement of the details, usually in segments.

3. Types of survey notes being prepared on drawing papers, sheet after sheet, at arbitrary scale which have pertinent general outlines with the indications of the separate sheets and the numbers of the sheets. Their advantage is that the scale can be freely chosen with regard to the insertion of the names and scales; their disadvantage is that they absolutely require a certain dexterity in drawing on the part of the workers.

The principles prescribe the control dimensions of the border lines, and the preparation of a 1:10 000 scale sketch containing the graphic base points which had been used. In my opinion, the site and the ordinal number of the control lines should be represented on the same sketch in a different color, but the sketch should include all the base points, i.e., also the numerical ones.

In the villages previously surveyed, the map renovation is the most difficult, but its most important operation is the establishment and control of the graphic base points (starting and terminal points) which are necessary for the surveying of land segments. This can be done only by an experienced worker. After these points have been staked out with wooden pegs and indicated in the sketch, the surveying of the details and the positioning of the subordinate points of the surveying lines can be also done by less experienced or novice workers.

Here I should like to reflect upon a problem connected with the No. 10 law decree. For reason of the continuousness of agricultural works, the distributions had to be done rapidly. Of course, an accurate work could not be done during such a short time; therefore, the inferior quality of the work depended not only on the goodwill or the lesser preparedness of the workers, but it can be mostly ascribed to the short term of execution. The No. 10 law-decree distributions—just as much as the 1945 land reform distributions— have to be wholly resurveyed, and the area of the individual lots has to be calculated. At the map renovation works, these boundaries cannot be used as ancient boundaries; even the sketches of the No. 10 law-decree can be used for the determination of the owner or of the user only with adequate control. Hence, the fact that a certain village was affected 70% or 80% by the No. 10 law decree is not a factor which would make things easy—as it is manifest from the hitherto approved technical plans of the AFTH—but rather an aggravating factor.

At map plotting the change in the paper's size has always to be taken into consideration. I consider that the method of map plotting with the tracer stripes is the most suitable and most practical method at such places where no stone-fixed base points exist and where the ancient boundaries are numerous.

The area calculation of the land segments should be done in most cases from data measured in the natural setting, putting it on the black frames. In my opinion, the inferior results hitherto manifested in the area calculation must be ascribed to inexperience. The novice workers are in some cases unable to properly apply the methods of measurements in site, of the transformation of "harp" (:hárfa) and of area.

In reference to the question of instruction, in my opinion, in the material of the training of technicians, the topics related to other questions of map renovation should get a wider field; on the other hand, the time spent on triangulation and multangulation, which requires a greater technical knowledge, can be considered

wasted because of the lack of later exercises. The present winter season is especially suitable for instruction since the majority of the workers resides at the headquarters of the executive organs, and they have the experiences of another year to rely upon.

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PERSONALITIES

[p.64]

Alexander RADÓ, leader of the independent cartographic divisions of the AFTH, on the basis of his past scientific work, was declared by the Committee on Scientific Qualifications doctor of the geographic sciences.

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The Hungarian Revolutionary Worker-Peasant Government appointed Alexander RADÓ university professor at the Chair of Economic Geography of the Karl Marx University of Economic Sciences.

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The Presidium of the People's Republic, on the occasion of the 40. anniversary of the foundation of the Hungarian Communist Party presented to Alexander RADÓ, university professor, the "Decoration of Work" in recognition of his activities performed in the revolutionary movement of the workers.

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NEW SURVEYING ENGINEERS

[1959,11: 64]

On 16 and 17 December 1958, at Sopron, the first correspondence students for surveyorship have defended their diploma plans (i.e., theses):- John GYÖRY, Béla JAGASITS, István JUHÁSZ, Elemér KEMÉNYFI, Sándor LUCHESI, László P. NAGY, Paul Jenő NAGY, Tibor NAGY SZABÓ, Mrs. Imre OCSKAY (née Eva SÓLYMOSSY), Béla SZABÓ, Géza VAGÁCS, and George WINKLER. Among them one received his diploma with excellence, four had first rate, four had good, two had medium, and one had satisfactory rating.

Their nice scholastic achievement points out that the form of correspondence courses, if we satisfy its special material and personal requirements, could become a serious factor in the training of experts who are loyal to their working places.

We greet warmly the new surveyors whose only new thing is their diploma since they have been our colleagues for about 13 years, as an average. We hope that the liberated work-enjoyment and energy

which they hitherto spent, with the performance of their official duties, on the finishing of their studies will be put by them into the service of the development of the Hungarian geodetics, thereby paying their tribute also to that social system which made their technical training possible.

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COMPETITIONS AT THE HUNGARIAN ACADEMY OF SCIENCES

[p.64]

There is one appointed geodetic topic at this year's competition of the Division of Technical Sciences of the MTA (:Magyar Tudományos Akadémia: Hungarian Academy of Sciences): "Employment of photogrammetry at the 1:10 000 and larger-scale map making under Hungarian conditions. The study should especially consider the question of economy and accuracy".

Beside the correspondant and regular members of the Academy, everyone may participate in the competition. The competition is under motto. The closing date for submitting the competition essays is 1 Sept. 1959. The contestants have to submit their work in two bound copies at the Technical Sciences Division of the MTA (V. Nádor Street 15, 4th floor, 431), together with a closed envelop which contains the name, occupation, working place and accurate address of the competitor and is provided with the motto. The competition essays will be evaluated until 1 Dec. 1959, and the works which best answer the requirements of the announcement will be awarded until 31 Dec. 1959. The highest sum of the individual prizes can be 8000 forints, the smallest amount 3000 forints.

The Technical Sciences Division of the MTA has also announced a contest for freely selected topics as it was done in the preceding years. A work already published cannot be submitted. In this competition the scientifically qualified persons, as well as the university students, aspirants and those persons whose profession is research (workers at the research branches of industri and the Academy) are not allowed to participate. These works have to be also submitted until 1 Sept. 1959 in two copies at the Technical Sciences Division. The best competitions essays will be awarded by the Division with a 1000 - 3000 forint prize until 31 Dec. 1959.

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CHANGES ON THE MAP

[p.65]

HUNGARY:

The Kiskőre-Abádszalók railway bridge over the Tisza river, which was destroyed by the Germans in 1944 in the Second World War,

was restored and put into operation in December 1958. The railway direct traffic was restored on the line between Kál-Kápolna and Kisujszállás. The bridge also serves for highway communication.

*

HUNGARY CZECHOSLOVAKIA:

In the sense of the 8 May 1958 agreement of Hungary and Czechoslovakia the following customs roads opened at the Hungarian Czechoslovak border:

For the railway passenger and freight traffic:- Komárom-Komarno; Szob-Sturovo; Somoskőujfalu-Filakovo; Hidasnémeti-Cana.

For railway freight traffic: Rajka-Rusovce, Ipolytarnóc-Kalonda, Bánréve-Lenartovce, Sátoraljaujhely-Slovenské Nové Mesto.

For long-distance highway communication: Rajka-Rusovce, Medve-Medvedov, Komárom-Komarno, Balassagyarmat- Slovenské Darmoty, Hidasnémeti-Milhost, Sátoraljaujhely- Slovenské Nové Mesto.

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NEW PROJECTION SYSTEM OF HUNGARIAN LARGE-SCALE MAPS

/1959, 11: p.167-169/ Dr William VINCZE

From the pages of this magazine our readers have already learned that the AFTH (:Állami Földmérési és Térképészeti Hivatal: State Geodetic and Cartographic Bureau) Geodetic Committee recently dealt with the question of the new projection system to be introduced in our large-scale maps. The first phase of this work is described in the article of Dr. Ludwig HOMORÓDI (NOTE: "Problems related to our new projection method". This journal, 1959, No. 2), but it will be perhaps interesting—in view of the importance of the question— if we supplement it in a few relations.

First of all, why did the Committee discuss the question of projection in the 1958-59 year?

It is well known that in February 1957 the AFTH brought the decision that the projection system of our large-scale maps shall be the Gauss-Krüger system with the 2° zonal width. This decision meant that in the future our maps are prepared in four projection and we shall have four systems of coordinates.

It is easy to see that the use of four projections is very disadvantageous from the point of view of both the survey and the transcription and recording of the changes on maps. Due to the unavoidable overlappings it is of course also disadvantageous from the viewpoint of mapping and recording of the base points. If for instance we count only with a $\frac{1}{4}^{\circ}$ over-lapping, then at the junction of each projection zone a $\frac{1}{2}^{\circ}$ excess mapping will become necessary, and on this $\frac{1}{2}^{\circ}$ area the recording of two different coordinates. In case of four projection zones, there are 3 zones of matching, i.e., there appears to be a 1.5° or more than a 20% surplus.

A further disadvantage of the 2° width of zone would become manifest at the equalization (matching) of our filling net. Namely, in this way, the matching of the filling net could have been done only in the projection system of our small-scale maps, i.e., in the 6° Gauss-Krüger system, which would have caused the trouble that for the 1:10 000 map plotting the projection re-calculations should have been executed with the same accuracy as it is necessary for the more precise large-scale maps. And this is wrong in principle, as we had already pointed out earlier in one of our studies(2) and as the correctness of this principle has been also recognized by HOMORODI's above quoted article. (NOTE: 2: "Geodetics and economy". This journal, 1958, No. 2).

On the basis of these considerations, as well as for the urgent reason that the equalization of the filling net has to be started, we have again put on the agenda in the meanwhile established AFTH Geodetic Committee the problem of projection of our cadastral maps.

The bases of our examinations are first of all those general viewpoints of principle which are justly considered at the selection of the projection system of the large-scale maps.

Such viewpoints are that:

1. the country should have as few projection systems as possible;

2. since it is the question of large-scale maps, the longitudinal distortion should not be larger than 1/10 000, even at the border of the projection.

The first point of view also includes that the nature of the projection system to be adopted also depends upon the shape of the country and upon its geographic situation.

For a country of regular multangular shape the stereographic projection is the most suitable; for a country which is elongated along the longitudes or latitudes, or along the spherical main meridian the cylindrical projections is the best; and for a country of general situation whose area is elongated not along the spherical main, the conical projection with oblique axis is the best.

For instance, from this point of view, for Romania the stereographic, for Hungary the cylindrical oblique-axis, and for Czechoslovakia the conical oblique-axis projection is the most suitable.

Considering the first point of view, the Gauss-Krüger projection system is the most advantageous without a doubt for countries elongated by the longitudes—such as for instance Italy or even England—, while for the countries situated in length along latitudes—especially if its North-South dimension is small in proportion to the East-West— this projection has disadvantages.

Just for this reason, since our country's expansion in the North-South direction hardly exceeds 2° and it is almost parallel with the latitudes, the use of the Gauss-Krüger projection system is substantially hardly an advantage. That is why all possibilities had to be very carefully examined in the selection of the projection.

At the reduction of the number of the projection systems, as well known, the sinking of the projective level of sketch —of the imaginary plane, cylinder or cone— can be also considered. (We think that not the sinking is imaginary but the projective level of sketch itself, since these projections can be also reproduced merely upon the basis of mathematical consideration).

As we know, the Gauss-Krüger projection system can be considered a widely accepted, international system. At large-scale mapping, usually the 2° or 3° zonal widths are used.

We have also studied this question first of all from the aspect how they satisfy the viewpoints of economy and accuracy.

Depending upon the degrees of latitude, the width of the zone diminishes. The selected width of zone is then economical if exactly at the border meridian it reaches the already mentioned 1/10 000 value of the projective longitudinal distortion. Then, the zone is economically exploited. Looking from this point of view at the Gauss-Krüger projection(1. Table), we find that the 2° zone cannot be exploited north of parallel 38°, while the 3° zone will satisfy the mentioned condition of longitudinal distortion only from the 59° north. By sinking, the 3° Gauss-Krüger projection can be used everywhere about north from 40° latitude.

TABLE

NAME OF COUNTRY		Half of zonal width		
		at 2° Km	at 3° Km	at 4° Km
Sweden	65°	47	71	94
Soviet Union	59°	57	86	115
East Germany	52,5°	68	102	136
Poland	52°	69	103	137
Czechoslovakia	49,5°	72	109	145
Hungary	47°	76	114	152
Bulgaria	41°	85	126	171
Italy and Greece	38°	88	131	176
Equator	0°	111	167	223
Permissible width: tangential position		88,0		
sectional position			126,0	126,0

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On the basis of these considerations we examined our existing cylindrical system, since it is the most appropriate for the shape and geographical location of the country. Here, the sinking of our central cylindrical projection promised the advantage that the country can be

represented in a single projection, and, with a little change of recalculation, our present cylindrical projectional maps —which are relatively of new surveying and at the metric scale— will further remain useful.

The further preservation of our stereographic projection system by means of sinking would have been advantageous for the reason that more than 80% of our cadastral maps was made in this projection, and in this case also a chance would have opened for the further utilization of the maps.

Yet, the disadvantage of both solutions is that our new triangulation mesh cannot be accurately fitted into the old projection systems, and/or we have to give it up entirely to keep a complete harmony between our old maps and the new network.

The idea also came up that the new network can be also used so that we do the fitting of the series (according to correlates, with the force of the base lines), for instance on our existing stereographic plane, independently from the existing series; then— leaving the angles and sides of the series as they are— by keeping the starting point of the present coordinate system, and by accepting the old azimuth of a triangular side as a preliminary value, we determine the orientation of the series (of the chain of maps) by fitting (by equalization). Relying upon this series, the other points can be calculated on the basis of new or old measurements. There may be a substantial difference between the thus calculated and the old coordinates of the points, but probably this difference could be rarely felt on our present maps.

This way, without endangering the good quality of the new network, some kind of concordance would remain between our old maps and the new net, which would mean that the new net could be easier used in our current works.

Yet, the maintenance of these projection systems would also mean the disadvantage that, even in case of sinking, the 1/10 000 condition of distortion could not be kept everywhere, moreover its introduction would cause considerable computing—table-preparing— work, although the latter is not an unsurmountable obstacle, with the present status of computing technics.

Thereafter we examined the possibilities of the use of the Gauss-Krüger projection system. Without sinking, four zones should be needed even from the 3° widths of zone. In other words, even this projection could be used with sinking only. However, thereby we give up to some degree the international character of the projection system, and it cannot be avoided to have a zone of overlap. It is also a drawback that this system has no relations with our present maps. (Here we mention that just any kind of copying our existing maps on maps prepared in the new projection system would not be correct, since this is a big work and it would not reach the accuracy which is to be required from maps prepared in the new projection system). On the other hand, its advantage is that finished

tabulations are available for the computations, and it is in close connection with the similar Gauss-Krüger projection of 6° zonal width used for our 1:10 000 maps.

As we can see, each of the three examined variants have advantages and drawbacks. Among them it is undoubtedly the stereographic projection which can be taken into consideration, on account of the shape of the country. Yet, the two cylindrical projections do not have such qualities in contrast with the other which would mean an unquestionable advantage for any of them. One has the great advantage that the country can be represented in a single coordinate system, for the other advantages are those circumstances that ready tabulations make its introduction easy and it has a direct connection with the projection system of our 1:10000 maps.

The measure (rate) of sinking in this case is determined thereby that the longitudinal shortening at the central meridian (tangential meridian) should be 1/10 000, i.e., in case of re-calculation, 1/10 000 part should be deducted from each original Gauss-Krüger coordinate.

The Geodetic Committee of AFTH, at its 11 March session of this year, on the basis of the examinations outlined above and in HOMORODI's article, approved the proposal that the calculation of the triangulation points up to the 3rd order of network, respectively including the B points, has to be carried out on the unchanged (hence, on the non-sunk) 3° wide Gauss-Krüger projective zone which belongs to the degrees of 18° and 21° longitudes. It proposes the $m_0 = 0{,}99990$ reduction factor as the measure of sinking.

With the introduction of the new projection system, a new problem arises in the shifts of the coordinate axes as well as in the sectorial division of the large-scale maps. The Committee wishes to discuss this actual problem at a later date.

Simultaneously the Geodetic Committee examined also the question of what advantages would come from the 3° Gauss-Krüger projection, after the standardization of the reduction factor, for the countries of the people's democracies.

We have already mentioned that north of the 40th parallel it can be suitably applied from the point of view of both the zonal width and the accuracy. And this means that, from the southern border of Bulgaria up until the 55° latitude, this constant can be well applied, furthermore that even at the 35° parallel, at the border of the 3° zone, the rate of the longitudinal distortion would be 13 cm/Km.

These proposals of the Geodetic Committee were also discussed by the Geodetic Main Committee of the Hungarian Academy of Sciences, also accepted by it, then they were discussed by the Collegium of the AFTH and changed into a final decision.

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GEODETIC CONFERENCE AT BUDAPEST

/p.228-229/

We wished to celebrate the 10th anniversary of the beginning of the training of geometers at Sopron together with the Technological University and the Sopron Group of the Hungarian Geophysical Society. Meanwhile, the Presidium of the Hungarian People's Republic has already straightened out the disputed questions which existed for some time in connection with the training of surveying engineers. According to the decree, the training of surveying engineers will be at the Construction and Communication Technical University at Budapest, starting from the fall of this year. Considering the fact that the works of reorganization started at once, the management of our Society decided to hold the lectures of the Conference without change of date at Budapest, and to postpone the celebration of the 10-year anniversary. Thus, it came to the Geodetic Conference between 25 and 27 June at Budapest.

On 25 June, in the lecture hall of the Hungarian Academy of Sciences, in the presence of numerous interested people, Dr. h. c. Dr. Anton TÁRCZY-HORNOCH, Academician, president of the Society, opened the conference.

The following scientific lectures were heard on the Conference:

Dr. A. A. ISOTOV:(Moskva): The comparative base lines.

Dr. Stephan HAZAY(Budapest): Mechanical principles of fitting.

Dr. Béla MILASOVSZKY(Miskolc): The problem of optimum star at measurements of longitude.

Dr. K. LEDERSTEGER(Wien): Most recent researches in the field of the normal spheroid theory of the Globe.

Dr. Anton TÁRCZY-HORNOCH(Sopron): Recalculation of the horizontal angles measured on the surface of the Earth into ellipsoid.

Géza ZELCSÉNYI(Budapest): Equalization of points of junction.

Julius ALPÁR & Joseph SOMOBYI(Sopron): Examination of the oscillation of the vertical axis of teodolits.

We do not go into more detailed description of the lectures, since they will be soon published entirely either in this journal or in other publications.

During the Conference, the Hungarian geodetic instruments factories (MOM and Gamma) showed in a small exhibit at the House of Technics their most recent instruments, and the patterns of the instruments to be manufactured in the near future. The small exhibit well illustrated the advances in the manufacture of Hungarian geodetic instruments. Our foreign and Hungarian guests who inspected the exposition praised the nice instruments. It is a pity that the exposition was open for 3 days only, thus several interested persons could not visit it.

The lectures of the Conference as well as the visiting of the institutions and instruments factories at Budapest were a great success.

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